

apparatus and performing aberration correction over respective transparent substrates of said N optical discs having different thicknesses; and

at least one photo detecting means for detecting reflected light from said optical disc loaded in said apparatus through said converging means and for outputting the detected reflected light as an electrical signal,

wherein said converging means converges said light flux as a smaller spot diameter D by employing a larger one of said numerical apertures, with respect to one of said optical discs having a thinner one of said substrates,

wherein thicknesses of said transparent substrates of said N types of optical discs are about 1.2mm or less than 1.2mm, and

wherein the thickness of the transparent substrate of the optical disc is discriminated by said electrical signal which is output by said at least one photo detecting means for detecting said reflected light from said optical disc through said converging means.

87. An optical recording/reproducing apparatus for recording, reproducing or erasing an information signal onto/from any one of N types (where $N \geq 2$) of optical discs having first layers of different thicknesses, each type of said optical discs having at least said first layer being transparent and a second layer for storing information, by converging a light flux onto said second layer through said first layer, said apparatus comprising:

at least one light emitting means for emitting a light flux;

a converging means having different effective numerical apertures for converging said light flux on said second layer of corresponding one of said N types of optical discs loaded in

said apparatus and performing aberration correction over respective said first layer of said N optical discs having different thicknesses; and

at least one photo detecting means for detecting reflected light from said optical disc loaded in said apparatus through said converging means and for outputting the detected reflected light as an electrical signal,

wherein said converging means converges said light flux as a smaller spot diameter D by employing a larger one of said effective numerical apertures, with respect to one of said optical discs having a thinner one of said first layers,

wherein thicknesses of said first layers of said N types of optical discs are about 1.2mm or less than 1.2mm,

wherein the thickness of said first layer the optical disc is discriminated by said electrical signal which is output by said at least one photo detecting means for detecting said reflected light from said optical disc through said converging means.

88. An optical recording/reproducing system comprising;

(a) an optical recording/reproducing apparatus for recording, reproducing or erasing an information signal onto/from any one of N types (where $N \geq 2$) of optical discs having transparent substrates of different thicknesses, each type of said optical discs having at least said transparent substrate and an information layer, by converging a light flux onto said information layer through said transparent substrate, said apparatus comprising:

at least one light emitting means for emitting a light flux;

a converging means having different numerical apertures for converging said light flux on said information layer of a corresponding one of said N types of optical discs loaded in said

apparatus and performing aberration correction over respective transparent substrates of said N optical discs having different thicknesses; and

at least one photo detecting means for detecting reflected light from said optical disc loaded in said apparatus through said converging means and for outputting the detected reflected light as an electrical signal,

wherein said converging means converges said light flux as a smaller spot diameter D by employing a larger one of said numerical apertures, with respect to one of said optical discs having a thinner one of said substrates,

wherein thicknesses of said transparent substrates of said N types of optical discs are about 1.2mm or less than 1.2mm,

wherein the thickness of the transparent substrate of the optical disc is discriminated by said electrical signal which is output by said at least one photo detecting means for detecting said reflected light from said optical disc through said converging means,

(b) a system controlling means coupled to said converging means for moving said converging means relative to the optical discs loaded in said apparatus to traverse a recording track thereof; and

(c) a signal processing means coupled to said photo detecting means for encoding or decoding said information signal.

89. An optical recording/reproducing system comprising;

(a) an optical recording/reproducing apparatus for recording, reproducing or erasing an information signal onto/from any one of N types (where $N \geq 2$) of optical discs having first layers of different thicknesses, each type of said optical discs having at least said first layer being

transparent and a second layer for storing information, by converging a light flux onto said second layer through said first layer, said apparatus comprising:

at least one light emitting means for emitting a light flux;

a converging means having different effective numerical apertures for converging said light flux on said second layer of corresponding one of said N types of optical discs loaded in said apparatus and performing aberration correction over respective said first layer of said N optical discs having different thicknesses; and

at least one photo detecting means for detecting reflected light from said optical disc loaded in said apparatus through said converging means and for outputting the detected reflected light as an electrical signal,

wherein said converging means converges said light flux as a smaller spot diameter D by employing a larger one of said effective numerical apertures, with respect to one of said optical discs having a thinner one of said first layers,

wherein thicknesses of said first layers of said N types of optical discs are about 1.2mm or less than 1.2mm, and

wherein the thickness of said first layer the optical disc is discriminated by said electrical signal which is output by said at least one photo detecting means for detecting said reflected light from said optical disc through said converging means,

(b) a system controlling means coupled to said converging means for moving said converging means relative to the optical discs loaded in said apparatus to traverse a recording track thereof; and

(c) a signal processing means coupled to said photo detecting means for encoding or decoding said information signal. --